

REMARKS

This communication is a full and timely response to the Office Action dated May 29, 2009. Claims 1, 4, 6-11, and 14-20 remain pending, where claims 2, 3, 12, and 13 were previously canceled. By this communication, claim 5 is canceled without prejudice or disclaimer of the underlying subject matter and claim 1 is amended.

In paragraph numbered 10 on page 3 of the Office Action, claims 5 and 14-20 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse this rejection. However, because claim 5 is canceled, this rejection is rendered moot and its withdrawal is respectfully requested.

Applicants claims stand variously In paragraph numbered 11 on page 4 of the Office Action, claims 1, 4, 6, and 9-11 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by *Lepore et al* (U.S. Patent No. 5,373,305) as evidenced by the *Encyclopaedia Britannica*. Applicant respectfully traverses this rejection.

Applicant's independent claim 1 recites the following:

An active spacecraft antenna metal free thermal control film comprising a multi-layer interference filter having alternating high and low refractive index non-metallic layers, said control film exhibiting preselected high absorbency and emissive characteristics in the far infrared wavelength range 2.5 μ m to 50 μ m, low absorbency characteristics in the solar spectrum range 200-2500nm and high transmissive characteristics in the microwave frequency spectrum 1 to 30GHz.

Contrary to the Examiner's assertion, *Lepore* fails to anticipate Applicant's claims. *Lepore* discloses an RF transparent thermal insulation blanket for an antenna reflector. The blanket uses an outer coating of germanium to reflect some

of the solar spectrum. This outer coating is particularly important to the design because it "controls the thermo-optical properties (i.e., both decreasing solar absorptance and maintaining emittance) without undesirably increasing RF insertion loss." See Lepore, col. 5, ll. 64. *Lepore* does not employ a multi-layer interference filter having alternating high and low refractive index layers nor one that does not include the germanium coating in its application. In each of the working examples provided in *Lepore* the germanium coating is provided to achieve the desired properties.

On page 6 of the Office Action, the Examiner acknowledges that germanium is intermediate in properties between metals and non-metals (i.e., between silicon and tin in the periodic table), and based on this assertion that germanium is a non-metal. Applicant disagrees with the Examiner's assertion, as one of ordinary skill would understand that given the metalloid properties of germanium, this element is more aptly described as semi-metallic. In other words, it has some metallic properties. Thus, based on its acknowledged material composition a prudent and reasonable interpretation of this material would find that it cannot be considered a non-metallic material.

Based on the foregoing discussion, the application of *Lepore* fails to establish a *prima facie* case of anticipation. To properly anticipate a claim, the document must disclose, explicitly or implicitly, each and every feature recited in the claim. See Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Withdrawal of this rejection, therefore, is respectfully requested.

In paragraph numbered 12 on page 8 of the Office Action, claims 1, 4, and 6-7 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by *Iacovangelo et al* (U.S. Patent No. 6,587,263). Applicant respectfully traverses this rejection.

Iacovangelo discloses numerous embodiments of a solar reflector. Each embodiment includes the basic structure of a substrate, bond layer, a reflective layer, and a radiative layer. In each of the disclosed embodiments, the bond layer is made of a metal or metal alloy and the reflective layer is made of silver or aluminum. See e.g. Iacovangelo, pgph bridging cols. 3 and 4.

As noted above, Applicants claimed embodiment comprises, among other features, a multi-layer interference filter having alternating high and low refractive index non-metallic layers. Because *Iacovangelo* discloses a reflector that includes metallic layers this reference does not anticipate Applicant's claims. Withdrawal of this rejection, therefore, is respectfully requested.

In paragraph numbered 13 on page 11 of the Office Action, claims 1 and 4-11 are either rejected as allegedly being anticipated under 35 U.S.C. §102(b), 102(f) or obvious under 35 U.S.C. §103(a). Applicant respectfully traverses these rejections.

The Examiner alleges that Applicant's claimed embodiment is a derived use of a previously existing 3M material or technology. As provided in Applicant's disclosure the disclosed thermal film "comprises" Radiant Mirror Film products such as those of 3MTM. The final optical properties of the mirror are achieved by alternating, stretching, cooling of the multi-layer material or inserting new layers. This "processing" in essence creates a new structure. On pages 9 and 10 of the disclosure, Applicant describes various characteristics and a space application of the multi-layer film. The "processed" multi-layer film together with the various

characteristics and application provide an effective example of Applicant's claimed embodiments. The "processed" film that achieves the desired characteristics in the desired application as disclosed embodies a new, novel, and non-obvious material. Accordingly, Applicant's claims are not anticipated or rendered obvious by the 3M VM2000 document.

The Examiner's rejections for alleged unpatentability are as follows:

In paragraph numbered 14 on page 12 of the Office Action, claims 1, 4, 6, and 11 are rejected for alleged unpatentability over "*3M Radiant Mirror Film VM 2000F1A6*" (3M VM2000) in view of *Lepore et al* (U.S. Patent No. 5,373,305); in paragraph numbered 15 on page 13 of the Office Action, claims 7 and 9-10 are rejected as allegedly being unpatentable over *Lepore et al* in view of *Iacovangelo et al*; and in paragraph numbered 16 on page 14 of the Office Action, claim 8 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Lepore et al* in view of *Iacovangelo et al* and *Fischell* (U.S. Patent No. 3,671,286). Applicant respectfully traverses these rejections.

The combination of the 3M VM2000 document, *Lepore*, *Iacovangelo*, and *Fischell*, where applicable, fails to disclose or suggest every feature recited in Applicant's claims.

Namely, the 3M VM2000 document discloses a relatively raw material, which in an unprocessed form cannot be used in a space application. As discussed above, *Lepore* discloses a thermal insulation blanket that requires a layer of germanium to achieve the desired results. One of ordinary skill would recognize and understand that germanium is a semi-metallic material. Because the layer of germanium introduce additional factors and/or properties in "tuning" or otherwise configuring the

multi-layers to achieve the desired response, Applicant challenges whether the techniques and/or results implored by *Lepore* are transferable and applicable to the raw structure provided in the 3M VM2000 document.

Iacovangelo and *Fischell* fail to disclose or suggest features that remedy the deficiencies of the 3M VM2000 document and *Lepore* as alleged. Namely, each of these secondary references discloses structures that include metal layers and/or additional structural elements, where applicable, which when combined with the primary references still does not describe a structure that renders Applicant's claims as obvious.

The courts have established that the Office has the initial burden of establishing a **factual basis** to support the legal conclusion of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), the Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some **articulated reasoning with some rational underpinning** to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (emphasis added). For at least the foregoing reasons, withdrawal of all rejections under 35 U.S.C. §103 is respectfully requested.

Conclusion

Based on the foregoing amendments and remarks, Applicant respectfully submits that claims 1, 4, 6-11, and 14-20 are allowable and this application is in condition for allowance. In the event any unresolved issues remain, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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